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The Ohio State University

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Stephen Hills and Richard Santos

Because job training in the U.S. is administered through employers, unions, the armed forces, public schools, and proprietary schools, data must be obtained from a variety of sources, each with its own limitations. Individual household surveys provide much of the data on training, but the emphasis is often on training provided through the formal educational system. For example, the Census Bureau gathers data on formal educational attainment through its regular household survey, and special youth surveys (The High School Class of 1972, High School and Beyond, The NLS Youth Cohort) provide detailed information on curriculum choices within the schools and on post-secondary training. Finally, the operational data obtained from training institutions themselves yield information on the number of individuals enrolled in training at a single point in time.

Combined data from individual surveys, household surveys, and training institutions suggest that at any one point in time between 5 and 6 percent of youth in their late teens and early 20's are enrolled in some sort of post-secondary job training (Pollard 1981; NCES 1981a).[1] In addition, 30 percent of youth in this age range were enrolled and continuing their formal education in "regular" school in 1979 (NCES 1981a). By age 22, one-fifth of

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[1]In 1978, 1.8 million students were enrolled in training programs provided by post-secondary institutions, both public and private (NCES 1981a). Since these trainees were drawn from all age groups, the data are not easily converted into a proportion of out-of-school youth enrolled in post-secondary training. If all trainees were age 18-24, however, the 1.8 million would account for approximately 6 percent of this age group. A comparable figure drawn from individual survey data is that 4.6 percent of out-of-high-school youth age 16-22 were enrolled in a post-secondary training program when interviewed in 1979 (Pollard 1981). The first-year survey for the High School and Beyond study showed that 6 percent of high school seniors planned to attend a trade or business school in the year following high school (NCES 1981b).

American youth will have received some post-secondary job training (Pollard 1981), and 25 percent will have completed high school in a curriculum which was largely vocational rather than academic or general (NCES 1981b, Table 1).

Although they yield a good picture of how formal training is acquired through schools, these data indicate little about how training is ultimately used. Furthermore, the emphasis on educational institutions yields little or no data on the training provided by employers. Surveying all private firms and public sector organizations to obtain data on such training would be impractical, but employed individuals can be surveyed and asked how they acquired the skills now used in their jobs. One such survey, conducted in the mid-1960's under the Manpower Development and Training Act, described skill acquisition across a wide range of occupations and industries (U.S. Department of Labor, 1964). Recently, two questions from this survey were repeated in the 1980 NLS survey of men age 28-38, thus producing data on men who were at a stage where post-school training should be contributing significantly to current work skills. A comparison of these post-school training data with the data on formal training at earlier ages should yield better insight into the skill acquisition process for men in their prime working years.

The 1980 NLS Data

In 1980, 3370 young men who were currently employed or had been employed in previous twelve months were asked about preparation for their jobs.[2] Two basic questions addressed job training: What training methods did you use to

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[2]Men age 28-38 were first interviewed in 1966. The 1980 interview was the 11th interview administered since 1966. Problems of attrition and its possible effects on these data are discussed in the appendix.

prepare for a job? and Which method was most useful? College courses, courses taken in a technical institute or in a trade, vocational or business school, company training courses, and training offered by the military are considered formal. Learning on the job from a supervisor or someone else, working one's way up through promotion, learning from a relative or friend and picking up skills on one's own are informal methods. Apprenticeship is considered a combination of formal and informal methods because of its classroom component.

Multiple training methods could be identified by workers, but 65 percent reported only one. Table 1 shows the methods identified by young men to prepare for their current or most recent jobs. Informal methods greatly predominated, and on-the-job training (OJT) was by far the most popular--over 50 percent of the sample cited it as the most important. Whites ranked college courses as the second most important method, but informal methods ranked second for blacks. Fourteen percent of blacks picked up skills on their own, learned from relatives or friends, or worked their way up through promotion: only 7 percent indicated that they had acquired their skills through college. Furthermore, 12 percent of blacks indicated that no training was required for their jobs, compared with 4 percent of whites. Equal proportions of blacks and whites reported other formal methods in the "single most helpful" category--trade, vocational, or business schools, company training courses, military training or apprenticeship programs. Somewhat larger proportions of blacks than whites reported company training courses or the armed forces as most helpful; on the other hand, smaller proportions of blacks said that apprenticeship was most useful for them.

When considering all the methods used to prepare for jobs, we find similar rankings: almost 60 percent reported use of OJT. Informal methods

Table 1 Proportions of Men Age 28-38 in 1980 Reporting Use of Various Training Methods in Current or Last Job, by Race (percentage distribution)

Training Method	Single Most Helpful Method			All Methods Used[1]		
	White	Black	Total	White	Black	Total
Formal Methods						
College courses	15	7	14	26	9	25
Trade/vocational/ business school	4	4	4	8	5	8
Company training course	4	5	4	10	7	9
Armed Forces	2	3	2	2	4	3
Apprenticeship	4	2	3	5	3	5
Informal Methods						
On-the-job-training	51	54	51	59	60	59
Worked up by promotion	2	2	2	5	3	5
Relatives/friends	4	2	3	5	2	5
Osmosis-just picked it up	9	10	9	13	14	13
No training required	4	12	5	4	12	5
Other	3	0	2	5	1	5
Total	100	100	100	--	--	--
Sample Size	2656	714	3370	2656	714	3370

[1]Multiple methods could be reported. Thus percentages do not add to 100.

predominated; on the other hand, formal college courses were a strong second, reported by one-fourth of the whole sample as an important method for skill acquisition, but by only 9 percent of blacks. Almost three times more whites than blacks reported having had college coursework that was useful on their current jobs.

Respondents' Perceptions of Training Utilization

These perceived variations in usefulness of training methods may reflect both different participation rates in earlier training and differences in applicability of given types of training to subsequent jobs. The 1980 data can be used to establish the degree of previous participation in four types of formal training: 1) college, 2) trade, vocational, or business school, 3) the armed forces, and 4) apprenticeship. A comparison of these participation rates with the skill acquisition methods reported in 1980 will yield use rates for previously acquired training.

The rates of training use, as perceived by the NLS respondents, are shown in Table 2. Since the longitudinal record does not contain complete data on training,[3] the rates shown in Table 2 must be interpreted cautiously. Nevertheless some patterns seem clear. Much higher proportions of men who had

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[3]Even with regular interviews across time, data on accumulated training can be quite incomplete. For example, of those who cited military training as helpful for learning a job, only 47 percent had indicated in any of the interviews between 1966 and 1980 that they had ever been enrolled in military training. Eighty-three percent had been in the military but did not always report receiving specific training. Apprenticeship data are equally sketchy. Fifty-four percent of those who considered apprenticeship a useful means of acquiring job skills had recorded an apprenticeship in previous years. A low percentage occurs because apprenticeship data were obtained from respondents who had a journeyman's card. Data on schooling are more complete. Ninety-five percent of those who considered college courses helpful had been enrolled in college. The comparable figure for vocational/technical training was 70 percent.

Table 2 Proportions of Men Age 28-38 in 1980 Who Used Past Training as a Method to Learn Current Job Skills, by Race

	Blacks	Whites	Total
Percent of those with college courses who reported college as a training method for current job.	25	44	43
Percent of those with military training who reported military as a training method for current job.	17	6	7
Percent of those with a recorded apprenticeship who reported apprenticeship as a training method for current job.	31	37	37
Percent of those with vocational or trade school training who reported voc-ed as a training method for current job.	13	15	15

apprenticeship or college training cited these methods as important ways of learning jobs than was true for either vocational/technical training or training acquired in the military. Blacks were much more likely than whites to report that they had used their military training, and they were much less likely to consider that college courses were useful in acquiring job skills.

Some types of training clearly have more long-lasting relevance for acquiring the skills necessary for any one job. Of the four types of training, college course work was the most useful method when applied to the jobs held in 1980. Still, over half of the sample who had college training did not mention it as a method for acquiring job skills. Given job mobility, the training could have been useful on a previous job, if not on the specific job held in 1980. Our data do not measure the applicability of the training to previously held jobs, however.

The training use rate for men who had an earlier documented apprenticeship was almost as high as for men with college training. An argument traditionally made for apprenticeship training is that the wide range of skills acquired will be more generally applicable over a lifetime than would be the case if a craftsperson were trained specifically for his initial job. Since the use rate for apprenticeship training does not differ greatly from the rate for college courses, our data lend support to this argument. Compared to apprenticeship, the use rates for the specific skills learned in vocational or trade schools and in the military are certainly very much lower.

Training use rates show some quite dramatic differences by race. Little racial difference appears for post-secondary vocational training, but the use rate for apprenticeship training is several percentage points less for blacks than for whites, and the rate for military training is much greater for blacks

than for whites. The apprenticeship rates may imply that blacks have a harder time remaining in craft occupations than do whites, even after completing apprenticeship training. On the other hand, blacks may use their military training more extensively than do whites because of different employment opportunities following military service. Jobs for blacks may be linked more strongly to military training and employment opportunities for whites may be more strongly linked to formal educational attainment.

A similar line of reasoning could explain the strong racial difference in use rates for college training. For the argument to apply, however, blacks with some college training would take quite different jobs than whites with similar training, and the jobs for blacks would, on average, rely less on the college training that blacks had received. Is there a significant racial difference in the kinds of jobs acquired by men who had some college training? Why would the difference exist? Do we need to control more precisely for the amount of college training acquired? Does college training become more applicable as men are promoted into more responsible positions and are blacks less likely to be promoted? Are there simply strong racial differences in perceptions regarding the utility of college training for any kind of job?

Some but not all of these questions are addressed through a multivariate analysis which regresses the probability of using a given type of training on education, occupation and race. In a regression based only on those men who had college training, for example, the amount of education acquired was a highly significant predictor of whether college courses were reported as methods for learning current job skills (Table 3). Those with more education were likely to report it as useful. Control variables for types of work were also significant predictors in the regression equation, but even after

Table 3 Least Squares Regression Estimates for the Probability of Reporting Use of Each of Four Training Methods in Current or Last Job in 1980 (t-values in parenthesis)

Dependent Variables	Selected Independent Variables[1] Education in Years	Race Black	$\bar{R}^2$	N
Percent reporting use of college courses	.095*** (14.52)	-.082*** (-2.94)	.388	1708
Percent reporting use of military	-.019*** (-2.65)	.066* (1.82)	.019	498
Percent reporting use of apprenticeship	.011 (0.57)	-.181** (-2.04)	.136	208
Percent reporting use of vocational/trade school	-.016*** (-3.21)	-.023 (-0.82)	.039	1131

[1]Universe: Men age 28-38 who, from the longitudinal file, are known to have received each type of training. All regressions include control variables for one-digit occupation.

***significant at 1 percent, ** at 5 percent, * at 10 percent.

controlling for educational attainment and type of work, race was still strongly significant, leaving unanswered the question of why blacks consider their past college training less useful for performing their current jobs than do whites. Similar results occurred for apprenticeship training where, despite controls for level of education and kind of work, blacks were still significantly less likely than whites to cite their apprenticeship program as one of the methods they used to acquire current job skills.

Descriptive results for military training or training received from vocational technical schools were likewise not contradicted by the regression equations. In the former case, blacks were still significantly more likely than whites to report military training as a useful method and in the latter case, there was no significant racial difference. Regression analysis thus rules out the possibility that racial differences are due simply to different kinds of work or amounts of education. Future research is needed to determine why the racial differences persist in the perceived utility of training.

Skill Acquisition Methods and Formal Education

The mix of training methods differed significantly depending on a young man's formal educational attainment. High school graduates with some college (Table 4, col. 3) were more likely than any other educational group to use job skills learned through some training institution other than college. Sixteen percent cited trade/vocational, company training, or the armed forces as single most important methods of training. Men with some college were just as likely as men with no college to have learned their jobs through apprenticeship or in the armed forces, but they were considerably more likely to have acquired their job skills through company training or through trade, vocational or business schools.

Table 4 Training Methods Used by Educational Attainment, Men Age 28-38 in 1980

Training Method	Single most helpful method				Methods used			
	(1) High school dropouts	(2) High school graduates, no college	(3) High school graduates, 4 years college	(4) College graduates	(5) High school dropouts	(6) High school graduates, no college	(7) High school graduates, 4 years college	(8) College graduates
Formal Methods								
College courses	0	0	6	39	0	2	16	61
Trade/vocational/ business school	2	4	7	1	5	10	12	4
Company training course	1	4	7	4	5	8	13	10
Armed forces	1	2	2	1	1	3	3	1
Apprenticeship	3	5	5	1	3	7	6	1
Informal Methods								
On-the-job training	54	61	53	40	58	66	62	53
Worked up by promotion	2	1	3	2	3	4	5	6
Relatives/friends	7	4	3	2	8	5	4	3
Osmosis-just picked it up	19	10	8	5	25	14	12	8
No training required	9	7	4	3	9	7	4	3
Other	2	1	3	3	2	3	5	8
Sample size	469	1065	748	966	469	1065	748	966

Men with only a high school degree relied more on OJT for acquiring skills, and more reported that they picked up the skills on their own or that no training was required. High school dropouts relied heavily on informal training methods. Twenty-six percent either picked up job skills on their own or learned from relatives or friends as the principal means of preparing for their jobs. Another 9 percent indicated that their jobs required no training. For dropouts, training through technical institutes, companies, the armed forces or apprenticeship programs did not compensate for their lack of formal education but rather reinforced their disadvantaged position. Considerably fewer learned job skills by these methods than either high school graduates with no college or graduates who had obtained some additional college education.

Training Methods by Occupation and Industry

An important reason for a census of skill acquisition methods is to see how the methods vary across occupations and industries. Our data show that the variation is significant. Clerical workers and operatives rely more heavily on OJT to learn their jobs than any other occupational group. Sixty-five percent reported OJT as the single most helpful training method (Table 5). Nevertheless, a consistently high proportion of respondents reported OJT as the most helpful method, regardless of occupational category. With but two exceptions, men employed in farming and professional workers, 50 percent or more of any occupational group reported learning job skills through OJT. Even in the professions, 31 percent of respondents cited OJT as the single most important method for learning job skills.

Sales was by far the most likely occupation to acquire job skills through a formal company training program. In sales, technical and service positions,

Table 5 Single Most Helpful Training Method Reported Used in Current or Last Job by Men Age 28-38 in 1980, by Occupation[1]
(Percentage Distributions)

	Professional	Technical	Clerical	Sales	Crafts-persons	Operatives	Service	Farm Managers and laborers	Other laborers
Formal Methods									
College courses	49	11	12	4	2	1	3	2	1
Trade/vocational/ business school	4	2	4	2	8	2	6	0	0
Company training course	2	6	3	16	4	3	10	2	2
Armed forces	3	1	1	0	1	2	5	0	1
Apprenticeship	1	1	0	0	10	4	1	0	1
Informal Methods									
On-the-job training	31	57	65	50	52	67	49	34	52
Worked up by promotion	2	5	2	3	2	1	0	0	2
Relatives/friends	0	3	2	5	4	2	1	35	4
Osmosis-just picked it up	3	9	4	10	13	9	7	20	19
No training required	2	4	5	6	2	8	14	8	18
Other	4	2	2	5	1	1	5	0	0
Total	100	100	100	100	100	100	100	100	100

[1]Sample size is 3361.

company training was second only to OJT for proviging job skills. Table 6 shows that in sales, 25 percent of the respondents cited company training as one of the methods used, in service jobs, the proportion was 18 percent and in technical occupations, 12 percent. The proportion who mentioned formal company training never exceeded 10 percent in any of the other occupational categories, surprising given the current emphasis on the development and training of personnel in large private firms.

Significant numbers of sales workers, craftsmen and laborers claimed to have learned job skills on their own. For crafts, 19 percent cited this as one of the methods of learning and 13 percent as the single most important method (see Tables 5 and 6). Despite the emphasis on formal apprenticeship in crafts occupations, the proportion learning job skills on their own was higher than in any other job category. Apprenticeships were cited by only 13 percent of craftsmen as one of the methods for learning job skills and by only 10 percent as the single most important method. As in other occupations, OJT was deemed more important, cited by 52 percent of the craftsmen as the single most important method of acquiring skills. Among all the job categories, service workers and laborers were the most likely to answer that no training was necessary for their jobs. Even here, OJT was cited by the majority as the main way to gain job skills.

Interesting variation also occurred across industries (Tables 7 and 8). Traditionally, public training institutions have placed considerable emphasis on training workers for the construction and manufacturing sectors of the economy. One envisions the training of machinists and carpenters as part of the "partnership" which can occur between the private sector and institutions providing formal training. This vision is far from the reality depicted by our respondents, however. In manufacturing only 13 percent reported that <u>any</u>

Table 6 Proportions of Men Age 28-38 in 1980 Reporting Use of Various Training Methods, by Occupation[1]

	Professional	Technical	Clerical	Sales	Crafts-persons	Operatives	Service	Farm managers and laborers	Other laborers
Formal Methods									
College courses	70	29	25	13	5	1	14	5	2
Trade/vocational/ business school	7	6	5	8	15	5	11	2	0
Company training course	6	12	10	25	8	7	18	2	2
Armed forces	4	2	1	1	3	2	6	0	1
Apprenticeship	3	2	0	0	13	5	1	0	1
On-the-job training	44	68	73	57	61	71	58	35	54
Worked up by promotion	6	9	5	6	3	1	1	0	2
Relatives/friends	1	5	2	7	5	3	2	43	4
Osmosis-just picked it up	7	12	7	13	19	12	8	26	22
No training required	2	4	5	6	2	8	14	8	18
Other	8	6	3	9	3	2	8	0	1

[1]Sample size is 3357.

Table 7 Proportions of Men Age 28-38 in 1980 Reporting Use of Various Training Methods, by Industry[1]

	Agriculture	Mining	Construction	Manufacturing	Transportation	Trade	Finance insurance, real estate	Business and repair	Personal services	Entertainment and recreation	Professional services	Public administration
Formal Methods												
College courses	13	18	9	18	13	11	35	19	18	24	72	34
Trade/vocational/ business school	3	6	10	8	11	5	6	15	21	3	5	9
Company training course	2	14	2	9	17	10	28	8	16	4	3	17
Armed forces	0	6	1	2	6	1	1	3	3	0	2	6
Apprenticeship	0	3	15	5	6	3	0	1	2	9	3	1
Informal Methods												
On-the-job training	34	69	59	73	61	61	62	56	53	25	35	64
Worked up by promotion	0	8	2	6	5	5	3	4	10	9	2	6
Relatives/friends	35	2	8	2	4	5	3	5	2	11	1	1
Osmosis-just picked it up	23	9	24	9	10	17	8	17	16	30	8	6
No training required	10	8	4	3	6	8	3	9	2	12	5	5
Other	0	8	2	3	4	4	8	7	5	5	10	9
Sample size												

[1]Sample size is 3349.

Table 8 Single Most Helpful Training Method Used by Men Age 28-38 in 1980, by Industry[1]
(Percentage Distributions)

	Agriculture, forestry, fisheries	Mining	Construction	Manufacturing	Transportation	Wholesale and retail trade	Finance insurance, real estate	Business and repair	Personal services	Entertainment and recreation	Professional services	Public administration
Formal Methods												
College courses	8	7	4	9	5	5	14	7	8	14	57	14
Trade/vocational/ business school	1	0	4	4	4	3	2	9	14	3	3	3
Company training course	2	4	1	4	7	5	15	3	2	4	1	8
Armed forces	0	2	1	1	4	1	0	1	3	0	2	5
Apprenticeship	0	2	10	4	5	2	0	1	2	9	1	1
Informal Methods												
On-the-job training	32	56	51	65	56	53	54	48	44	21	23	53
Worked up by promotion	0	8	1	3	1	4	1	1	6	8	1	3
Relatives/friends	29	2	6	1	3	4	2	4	0	0	0	0
Osmosis-just picked it up	18	8	17	6	8	12	6	13	16	26	3	4
No training required	10	8	4	3	6	8	3	9	2	12	5	5
Other	0	4	1	1	1	2	4	5	2	3	5	4
Total	100	100	100	100	100	100	100	100	100	100	100	100

[1]Sample size is 3353.

formal training method other than college courses was the main way to learn a job, whereas two-thirds reported OJT (Table 8). In construction, 20 percent cited formal training (including apprenticeship) as the main method of acquiring skills and 51 percent cited OJT. Construction showed a higher proportion of men who learned their skills from a relative or friend than any other industry except agriculture. Over 75 percent in the agriculture industry rely primarily on informal methods; nearly a fifth "picked it up" and almost another third relied on OJT; 29 percent rely on relatives and friends. Wholesale and retail trade and the business and repair service industry also rely significantly on friends and relatives for preparing young men for their jobs. The greatest reliance on vocational and trade schools came from the business and repair and personal service industries, largely due to the number of auto mechanics, barbers and beauticians trained.

Training Methods in the Private Sector

Because of the current emphasis on private sector training, we subdivided our data to show what skill acquisition methods were reported by men employed in private firms. Within the private sector we expected different answers from white and blue collar employees because private firms tend to sponsor separate training programs for salaried and hourly employees. For the purpose of comparison, we defined white collar occupations as professional, managerial, clerical and sales positions. About 70 percent of the white collar jobs in our sample were professional or managerial and the remainder were clerical and sales. We defined blue collar occupations to be craft, operative, service, and laborer positions.

College training was one of the primary methods white collar private sector workers used to acquire job skills, second only to OJT (Table 9). Over

Table 9 Utility of Training Methods as Perceived by White and Blue Collar Males Age 28-38 in 1980 Working in the Private Sector

Training Method	Most helpful method			Methods used		
	White collar	Blue collar	Total	White collar	Blue collar	Total
Formal Methods						
College courses	20	1	10	39	3	20
Trade/vocational/ business school	3	4	4	7	9	8
Company training course	6	4	5	15	8	11
Armed forces	1	1	1	3	2	2
Apprenticeship	1	7	4	2	9	5
Informal Methods						
On-the-job training	54	61	58	66	66	66
Worked up by promotion	3	2	2	8	2	5
Relatives/ friends	1	2	2	2	3	2
Osmosis-just picked it up	4	11	8	8	15	12
No training required	3	7	5	3	7	5
Other	3	1	2	5	2	4
Sample size	1001	1366	2367	1001	1366	2367

one-third cited college training as one of the methods used to learn a job, and one-fifth listed it as the primary method. The proportion of workers who named company training as a skill acquisition method was almost twice as great among white collar workers as among blue. Only 8 percent of blue collar workers reported use of company training programs to learn job skills. On the other hand, 9 percent of blue collar workers but only 2 percent of white collar workers mentioned apprenticeship. Trade, vocational and business school training applied almost equally to the jobs held by white and blue collar workers in private firms.

An important question is what determines whether or not a worker will receive formal training financed in whole or in part by an employer. Company training may compliment or serve as a substitute for formal education. Race may or may not be an important factor influencing the receipt of training, once personal characteristics and the special characteristics of industries are controlled. Using regression analysis, we tested for these possibilities within the private sector. The dependent variable in the regression equation was whether or not formal company training and apprenticeship were reported as methods for learning job skills. Separate equations were estimated for white and blue collar workers, testing for the effects of education and race on the probability that company training or apprenticeship would be cited. Control variables included industry in which a respondent worked, whether or not he had received post-secondary vocational training, his attitudes (based on the Rotter scale)[4], and his past history of employment stability (proportion of the past 14 years in which a young man was unemployed).

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[4]The 4 items which refer to the respondent himself were used to calculate a score of internality or externality. Men who are more internal have a lower score and are presumed to be more motivated. See Gurin et al. (1978) for more information on the abbreviated scale.

For blue collar workers, formal education was a highly significant determinant of reported company training or apprenticeship (Table 10). Each additional year of education increased by 1.7 percentage points the probability that a respondent would report these two training methods. Race was also significant. All else constant, a black would be likely to report company training or apprenticeship at a level 8 percentage points lower than the level reported by whites. For blue collar workers, receipt of post-secondary vocational education had little influence on subsequent training in company or apprenticeship programs. Employment in the south did not significantly raise the probability of apprenticeship or company training, and married workers or workers who were more internal (more highly motivated) were not more likely to receive training. Employment stability over the past 14 years significantly raised the probability of training.

For white collar workers, neither the level of education nor race were significant predictors of subsequent company training. Married workers and "motivated" workers were more likely to have received training, though marital status was only marginally significant. The most important characteristic linked with reports of company training was industry: workers in finance, insurance and real estate, mining and transportation were more likely to report company training than those in manufacturing.

White collar workers on average have higher levels of education than do blue collar workers, so to conclude that white collar workers' levels of education have little impact on subsequent company training would not be warranted. Nevertheless within the higher range of education, variation in amount had little impact on reported company training as a skill acquisition method. On the other hand, variation within the range of educational levels characteristic of blue collar workers strongly affected their reports of

Table 10 Least Squares Regression Estimate for the Probability of Reporting Company Training or Apprenticeship as a Skill Acquisition Method in Private Sector Firms

	White Collar	Blue Collar
Education (years)	.001	.017***
	(0.15)	(3.79)
Received post-secondary voc-ed training	.048	-.001
	(1.05)	(-0.27)
Black	.003	-.080***
	(0.07)	(-3.43)
Rotter I/E score	-.009*	.001
	(-1.74)	(0.27)
Percent of last 14 years unemployed (in whole percentage points)	-.002	-.003**
	(-0.98)	(-2.23)
Married	.036	.030
	(1.34)	(1.34)
Resides in South	.023	.011
	(0.92)	(0.54)
Industry		
Agriculture	-.181	-.090*
	(-0.51)	(-1.81)
Mining	.281**	-.027
	(2.50)	(-0.55)
Transportation	.087*	.099***
	(1.98)	(3.27)
Construction	.046	.067**
	(0.77)	(2.32)
Wholesale/retail trade	.031	-.015
	(0.95)	(-0.46)
Recreation/entertainment	.007	.018
	(0.06)	(0.17)
Finance, insurance, real estate	.170***	-.120
	(4.37)	(-0.86)
Professional services	-.032	-.012
	(-0.88)	(-0.20)
Personal services	.030	.004
	(0.30)	(0.04)
Business services	.057	-.055
	(1.03)	(-1.23)
Manufacturing (base)		
Constant	.128	-.061
	(1.32)	(-0.85)
$\bar{R}^2$	.027	.047
F	2.52	5.13
Sample size	970	1310

***Significant at 1 percent, ** at 5 percent, * at 10 percent.

company training or apprenticeship programs. Race, furthermore, was strongly related to further training for blue collar workers, even after controlling for education levels. More attention should undoubtedly be paid to the causes of these strong differences between white collar and blue collar employees.

The Training of Crafts Workers

Because elaborate training methods are associated with the crafts, a more detailed analysis of this occupational category is desirable. Our data for craftsmen, however, point to a number of misconceptions about this group of workers. The crafts are often thought to rely heavily on apprenticeship and/or formal company training for developing skills. Yet with company training and apprenticeship combined, craft workers did not rank first in citing these two methods as key means for acquiring job skills. Sales workers relied more on company training than did craft workers on company training and apprenticeship combined (Table 5). The length of time required for learning skills, not the proportion who gain their skills through formal training, distinguishes craft workers from all others. Only 14 percent of craft workers stated that company training or apprenticeship was the most helpful principal method for acquiring job skills (Table 11).

A second misconception is to view craft occupations as alternatives to training in college, without recognizing how many craft workers have some college education. Almost a third of our sample of craftsmen in their prime working years had received some college training, and 7 percent of them were college graduates (Table 12). Two percent of the craftsmen who were sampled indicated that college coursework was the main method by which they had acquired job skills (Table 11). Thus entrance into a craft occupation did not preclude college training for a substantial number of our respondents.

Table 11 Utility of Training Methods Perceived by Male Craft Workers Age 28-38 in 1980, by Race

Training Method	Most helpful method			Methods used		
	White	Black	Total	White	Black	Total
Formal Methods						
College courses	3	0	2	6	1	5
Trade/vocational/ business school	8	8	8	15	13	15
Company training course	4	1	4	9	5	8
Armed forces	1	1	1	3	1	3
Apprenticeship	11	4	10	14	11	13
Informal Methods						
On-the-job training	52	59	52	60	67	61
Worked up by promotion	2	3	2	3	4	3
Relatives/ friends	4	6	4	5	7	5
Osmosis-just picked it up	13	13	13	20	16	19
No training required	2	4	2	2	4	2
Other	2	0	1	3	2	3
Sample size	553	147	700	553	147	700

Table 12 Educational Attainment of Male Craftsworkers Age 28-38 in 1980, by Race

(Percentage Distributions)

Educational attainment	Race		
	White	Black	Total
High school dropout	18	31	19
High school graduate, no college	50	38	49
High school graduate, some college	25	26	25
College graduate	7	5	7
Sample size	532	135	667

Finally, apprenticeship is often seen as the major vehicle for excluding blacks from craft occupations. Apprenticeship is, however, only one of several sources of discrimination. In Table 11 are shown the training methods reported by both white and black craftsmen. Substantially fewer black craftsmen than white cited apprenticeship as one method or as the single most important method for acquiring job skills. Yet similar racial differences are also apparent in virtually all of the other training methods listed for craftsmen. Blacks were much less likely than whites to mention college courses, company training, or the military as methods for learning skills and somewhat less likely than whites to mention trade, vocational or business school training. Blacks relied instead on informal training methods such as OJT or learning from relatives and friends.

We saw from the earlier regression analysis for blue collar workers that the degree of formal education significantly affects the probability of receiving company training. A certain level of formal education is also necessary to continue training in college, in vocational schools, and in trade or business schools and may be used to screen in candidates for military training as well. As a consequence a lower level of educational attainment among black craftsmen led to less training relative to whites. Thirty-one percent of our black craftsmen were high school dropouts compared with 18 percent of the white sample. Thirty-eight percent of the blacks were high school graduates with no college, whereas 50 percent of whites had comparable educational attainment (Table 12). Apparently more blacks than whites selected craft jobs as an alternative to continuing their education and then subsequently received less formal training. Formal education may therefore be serving as an important screening mechanism. An important question is whether educational attainment helps to identify future craft workers with the most

ability or whether it instead contributes to subsequent discrimination against blacks.

Summary

The NLS respondents interviewed in 1980 reinforced the finding from the mid-1960's that OJT is by far the most prevalent way of acquiring job skills. The earlier study of all labor force participants aged 22-64 found that 37 percent of those with less than three years of college reported OJT as the most helpful method of acquiring job skills. Our sample of young men aged 28-38 in 1980 also relied heavily on training on the job, 56 percent of those with less than three years of college reporting OJT as the main method for acquiring current job skills. Men in private sector firms did not rely heavily on formal training to acquire skills, but the industries where formal training programs were mentioned most often were mining, transportation, construction, and finance, insurance and real estate. The occupation most strongly associated with formal training was sales, and not, as might have been thought, the crafts.

Race and education were important determinants of formal training among blue collar workers. Less educated black workers were significantly less inclined to report company training as a skill acquisition method than their more highly educated white counterparts. Among white collar workers, however, neither differences in educational attainment nor race were important predictors of reported formal training. Motivation, marital status and industry were key factors instead.

Race was an important factor throughout this study. Rates of use of training differed strongly by race and were unaffected by introducing controls for level of education and type of job held. Race also affected the mix of

training methods reported by craftsmen, and its effects were shown in areas other than apprenticeship. Black craftsmen, because of their lower educational attainment, had less opportunity for any kind of formal training subsequent to schooling, apprenticeship or otherwise.

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Appendix

Because this report relies heavily on descriptive statistics drawn from the 14th year of a longitudinal survey, questions may arise regarding the data sample's representativeness. Attrition rates by the 1980 survey were 70 percent for whites and 54 percent for blacks. Weighted data are used throughout this report to adjust both for the oversampling of blacks in 1966 and for attrition between 1966 and 1980. The adjustment for attrition, however, is only partial. A comparison of mean values for selected 1966 characteristics, using both the original 1966 sample and the weighted 1980 sample, reveals some differences in population estimates. Examples are shown below.

1966 Characteristic	1966 estimate weighted to adjust for race (in percent)		1980 estimate weighted to adjust for race and attrition (in percent)	
	Blacks	Whites	Blacks	Whites
Age				
14-19	64.7	64.2	62.6	60.9
20-24	35.3	35.8	37.4	39.1
Education				
12 years	71.0	53.1	65.0	48.3
12 years	21.4	25.2	24.5	26.8
12 years	7.6	21.7	10.6	24.9
Percent Urban				
In an SMSA	65.8	70.1	61.8	68.9

For blacks and whites alike, respondents who were younger or less well educated in 1966 were more likely to be lost from the sample. Blacks differed from whites in that more urban respondents were lost from the sample by 1980. The proportion of white urban respondents was almost the same in 1980 as it was in 1966. Thus to the degree that training methods differ for urban

and rural young men, the estimates in this report are biased toward the methods used by rural black men. The bias does not seem large, however.

The Center has also been active in manpower planning both in the U.S. and in the developing countries. A project for the Ohio Advisory Council for Vocational Education identified the highly fragmented institutions and agencies which supply vocational and technical training in Ohio. Subsequent projects for the Ohio Occupational Information Coordinating Committee have followed graduates of these programs. These data and information on occupational distributions of employers collected for the Occupational Employment Statistics Program are being integrated into a comprehensive planning model which will be accessible to trainees and employers and linked to a national network.

Another focus of the Center's research is industrial relations and collective bargaining. In a project for the U.S. Department of Labor, staff members are working with unions and management in a variety of industries to evaluate several current experiments for expedited grievance procedures. The procedural adequacies, safeguards for due process, and cost and timing of the new procedure are being weighed against traditional arbitration techniques.

Senior staff also serve as consultants to many boards and commissions at the national and state level. Recently the Center's staff have produced papers and prepared testimony for the Department of Labor, the Vice President's Task Force on Youth Unemployment, the Joint Economic Committee of Congress, the National Commission for Employment and Unemployment Statistics, the National Commission for Employment Policy, the White House Conference on the Family, the Ohio Department of Corrections, the Ohio Board of Regents, the Ohio Governor's Task Force on Health, and the Ohio Governor's Task Force on Welfare.

The Center maintains a working library of approximately 10,000 titles, including a wide range of reference works and current periodicals, as well as an extensive microfilm and microfiche collection. Through their facilities linked to the University computer, the Center's data processing staff provide statistical, technical, and programming support both for in-house researchers and the over 250 users of the National Longitudinal Surveys data tapes. They maintain the NLS tapes, data base, documentation, and associated software.

For information on specific Center activities, write: Director, Center for Human Resource Research, 5701 North High Street, Worthington, Ohio 43085.

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Center for Human Resource Research

The Center for Human Resource Research is a policy-oriented multidisciplinary research organization affiliated with The Ohio State University. Established in 1965, the Center is concerned with a wide range of contemporary problems related to developing and conserving human resources. Its more than thirty senior staff members come from disciplines including economics, education, English, health sciences, industrial relations, management science, psychology, public administration, social work, and sociology. This multidisciplinary team is supported by approximately 70 graduate research associates, full-time research assistants, computer programmers, and other personnel.

The Center has become preeminent in the fields of labor market research and manpower planning. With continuing support from the United States Department of Labor, the Center has been responsible since 1965 for the National Longitudinal Surveys of Labor Market Experience. Staff have assisted in population and human resource planning throughout the world, having conducted major studies in Bolivia, Ecuador, Kenya, Sierra Leone, Venezuela, and Zaire. At the request of the National Science Foundation, a review of the state of the art in human resource planning was conducted. Other studies have assessed the impact of labor and education policy on labor supply and evaluated employment statistics collection methods. Senior personnel are also engaged in several other areas of research—collective bargaining and labor relations, evaluation and monitoring of the operation of government employment and training programs, and the projection of health education and facility needs.

The Center for Human Resource Research has received over two million dollars annually from government agencies and private foundations to support its research in recent years. Providing support have been the U.S. Departments of Labor, State, Defense, Education, Health and Human Services; Ohio's Health and Education Departments and Bureau of Employment Services; the Ohio cities of Columbus and Springfield; the Ohio AFL-CIO; the George Gund Foundation; the Rockefeller Foundation; and the Ford Foundation. The breadth of the Center's research interests is best illustrated by a brief review of a few of its current projects.

The Center's largest project is the National Longitudinal Surveys of Labor Market Experience. This project has involved repeated interviews over a fifteen-year period with four groups of the United States population: older men, middle-aged women, and young men and women. The data are collected for 20,000 individuals by the U.S. Bureau of the Census, and the center is responsible for data analysis. Since 1979, the NLS has followed an additional cohort of 13,000 young men and women between the ages of 14 and 21. This cohort includes for the first time those serving in the armed forces at the time of the initial interview. In addition to being the definitive U.S. national data set on the labor market activities of young adults, this continuing survey includes unique batteries of questions on such socially important issues as delinquency, alcohol and drug use, fertility, and prenatal care. For this cohort, field work is handled by the National Opinion Research Center. To date the Center's staff have prepared dozens of research monographs, special reports, and books on the NLS, and they also prepare and distribute data tapes for public use.

The Quality of Work Life Project, another ongoing study, began in 1975 as an attempt to improve the productivity and the meaningfulness of work for public employees in the cities of Springfield and Columbus. Center staff also served as third party advisers and researchers exploring new techniques for attainment of management-worker cooperation and worker health in a number of central Ohio private sector industries.

(Continued on inside back cover)